

November 17, 2009

Reply to the Office Action dated August 17, 2009

Page 4 of 15

**AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**LISTING OF CLAIMS:**

Claims 1-11 (canceled).

Claim 12 (currently amended): A brazing method for brazing a first member and a second member to be joined via a braze joint ~~formed by fusing and solidifying a brazing material~~, the method comprising the steps of:

preparing the first member and the brazing material foil, the first member including a base plate composed of a ferrous material and a diffusion suppressing layer laminated on the base plate for suppressing diffusion of Fe atoms into the braze joint from the base plate during the brazing, the diffusion suppressing layer being composed of a Ni-Cr alloy essentially comprising not less than about 15 mass% and not greater than about 40 mass% of Cr, the brazing material foil being composed of a Cu-Ni alloy essentially comprising not less than about 10 mass% and not greater than about 20 mass% of Ni;

assembling the first and second members into a temporary assembly with the brazing material foil disposed between the diffusion suppressing layer of the first member and the second member;

performing a brazing process by maintaining the temporary assembly at a brazing temperature of not less than about 1,200°C to fuse the brazing material foil and diffuse Ni atoms and Cr atoms into the fused brazing material foil from the diffusion suppressing layer to form the braze joint, causing the resulting brazing material of the braze joint to have a higher melting point than the brazing temperature ~~an increased melting point by the diffusion of the Ni atoms and the Cr atoms~~ to self-solidify all of the brazing material of the braze joint, wherein

November 17, 2009

Reply to the Office Action dated August 17, 2009

Page 5 of 15

the braze joint is free from segregated solidification and is composed of a Cu-Ni-Cr alloy comprising not less than about 34 mass% of Ni and not less than about 10 mass% of Cr; and  
cooling the resulting assembly.

Claim 13 (previously presented): The brazing method as set forth in claim 12, wherein the second member includes a base plate composed of a ferrous material, and a diffusion suppressing layer laminated on the base plate for suppressing diffusion of Fe atoms into the braze joint from the base plate during the brazing, the diffusion suppressing layer of the second member being composed of a Ni-Cr alloy essentially comprising not less than about 15 mass% and not greater than about 40 mass% of Cr.

Claim 14 (previously presented): The brazing method as set forth in claim 13, wherein the base plates of the first member and the second member are each composed of a stainless steel.

Claim 15 (previously presented): The brazing method as set forth in claim 12, wherein the Ni-Cr alloy of the diffusion suppressing layer has a Cr content of not less than about 30 mass%.

Claim 16 (currently amended): The brazing method as set forth in claim 12, wherein the brazing material foil has a thickness of not less than about 20 $\mu$ m and not greater than about 60 $\mu$ m.

Claim 17 (previously presented): The brazing method as set forth in claim 16, wherein the brazing temperature is not less than about 1,200°C and not higher than about 1,250°C, and a duration for which the temporary assembly is maintained at the brazing temperature is not shorter than about 30 min and not longer than about 60 min.

Claims 18-23 (canceled).

Claim 24 (new): A brazing method for brazing a first member and a second member to be joined via a braze joint, the method comprising the steps of:

preparing the first member including a base plate composed of a ferrous material, a diffusion suppressing layer laminated on the base plate for suppressing diffusion of Fe atoms into the braze joint from the base plate during the brazing and a brazing material layer laminated on the diffusion suppressing layer, the diffusion suppressing layer being composed of a Ni- Cr alloy essentially comprising not less than about 15 mass% and not greater than about 40 mass% of Cr, the brazing material layer being composed of a Cu-Ni alloy essentially comprising not less than about 10 mass% and not greater than about 20 mass% of Ni;

assembling the first and second members into a temporary assembly with the brazing material layer disposed on the second member;

performing a brazing process by maintaining the temporary assembly at a brazing temperature of not less than about 1,200°C to fuse the brazing material layer and diffuse Ni atoms and Cr atoms into the fused brazing material layer from the diffusion suppressing layer to form the braze joint, causing the resulting brazing material of the braze joint to have a higher melting point than the brazing temperature to self-solidify all of the brazing material of the braze joint, wherein the braze joint is free from segregated solidification and is composed of a Cu-Ni-Cr alloy comprising not less than about 34 mass% of Ni and not less than about 10 mass% of Cr; and

cooling the resulting assembly.

Claim 25 (new): The brazing method as set forth in claim 24, wherein the second member includes a base plate composed of a ferrous material and a diffusion suppressing layer laminated on the base plate for suppressing diffusion of Fe atoms into the braze joint from the base plate during the brazing, the diffusion suppressing layer of the second member being

November 17, 2009

Reply to the Office Action dated August 17, 2009

Page 7 of 15

composed of a Ni-Cr alloy essentially comprising not less than about 15 mass% and not greater than about 40 mass% of Cr.

Claim 26 (new): The brazing method as set forth in claim 25, wherein the base plates of the first member and the second member are each composed of a stainless steel.

Claim 27 (new): The brazing method as set forth in claim 24, wherein the Ni-Cr alloy of the diffusion suppressing layer has a Cr content of not less than about 30 mass%.

Claim 28 (new): The brazing method as set forth in claim 24, wherein the brazing material layer has a thickness of not less than about 20  $\mu\text{m}$  and not greater than about 60  $\mu\text{m}$ .

Claim 29 (new): The brazing method as set forth in claim 28, wherein the brazing temperature is not less than about 1,200°C and not higher than about 1,250°C, and a duration for which the temporary assembly is maintained at the brazing temperature is not shorter than about 30 min and not longer than about 60 min.